

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:
  - a thin film transistor over a substrate;
  - 5 an insulating film covering the thin film transistor;
  - a metal wiring on the insulating film, wherein the metal wiring is electrically connected to the thin film transistor;
  - a pixel electrode over the insulating film, the pixel electrode is electrically connected to the metal wiring; and
  - 10 a resin film between the insulating film and the pixel electrode for alleviating a step difference between an edge of the metal wiring and the insulating film.
2. A semiconductor device according to claim 1, wherein the resin film  
15 comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and benzocyclobutene.
3. A semiconductor device according to claim 1, wherein the  
20 semiconductor device is at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a projector.
4. A semiconductor device comprising:
  - 25 a thin film transistor over a substrate;
  - a capacitor element over the substrate;
  - an insulating film covering the thin film transistor and the capacitor element;
  - a first metal wiring on the insulating film, wherein the first metal wiring is  
30 electrically connected to the thin film transistor;

a second metal wiring on the insulating film, wherein the second metal wiring is electrically connected to the capacitor element;

a pixel electrode over the insulating film, wherein the pixel electrode is electrically connected to the first metal wiring and the second metal wiring; and

5 a resin film between the insulating film and the pixel electrode for alleviating step differences between an edge of the first metal wiring and the insulating film and between an edge of the second metal wiring and the insulating film.

10 5. A semiconductor device according to claim 4, wherein the resin film comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and benzocyclobutene.

15 6. A semiconductor device according to claim 4, wherein the semiconductor device is at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a projector.

20 7. A semiconductor device comprising:

a thin film transistor over a substrate;

a first insulating film covering the thin film transistor;

a metal wiring on the first insulating film, wherein the metal wiring is electrically connected to the thin film transistor;

25 a pixel electrode over the first insulating film, wherein the pixel electrode is electrically connected to the metal wiring; and

a second insulating film in contact with a sidewall portion of the metal wiring, wherein the second insulating film is interposed between the pixel electrode and the first insulating film, and has a curved surface at the sidewall portion of the  
30 metal wiring.

8. A semiconductor device according to claim 7, wherein the second insulating film comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and  
5 benzocyclobutene.

9. A semiconductor device according to claim 7, wherein a concentration of the second insulating film is 3 to 20% of that of the first insulating film.

10 10. A semiconductor device according to claim 7, wherein the semiconductor device is at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a projector.

15 11. A semiconductor device comprising:  
a thin film transistor over a substrate;  
a capacitor element over the substrate;  
a first insulating film covering the thin film transistor and the capacitor element;  
20 a first metal wiring on the first insulating film, wherein the first metal wiring is electrically connected to the thin film transistor;  
a second metal wiring on the first insulating film, wherein the second metal wiring is electrically connected to the capacitor element;  
a pixel electrode over the first insulating film, wherein the pixel electrode  
25 is electrically connected to the first metal wiring and the second metal wiring; and  
a second insulating film in contact with sidewall portions of the first metal wiring and the second metal wiring, wherein the second insulating film is interposed between the first insulating film and the pixel electrode, and has curved surfaces at the sidewall portions of the first metal wiring and the second metal  
30 wiring.

12. A semiconductor device according to claim 11, wherein the second insulating film comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and  
5 benzocyclobutene.

13. A semiconductor device according to claim 11, wherein a concentration of the second insulating film is 3 to 20% of that of the first insulating film.

10 14. A semiconductor device according to claim 11, wherein the semiconductor device is at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a projector.

15 15. A light emitting device comprising:  
a thin film transistor over a substrate;  
an insulating film covering the thin film transistor;  
a metal wiring on the insulating film, wherein the metal wiring is electrically connected to the thin film transistor;  
20 a pixel electrode over the insulating film, the pixel electrode is electrically connected to the metal wiring; and  
a resin film between the insulating film and the pixel electrode for alleviating a step difference between an edge of the metal wiring and the insulating film.

25 16. A light emitting device according to claim 15, wherein the resin film comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and benzocyclobutene.

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17. A light emitting device according to claim 15, wherein the light emitting device is incorporated in at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a projector.

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18. A light emitting device comprising:

a thin film transistor over a substrate;

a capacitor element over the substrate;

an insulating film covering the thin film transistor and the capacitor  
10 element;

a first metal wiring on the insulating film, wherein the first metal wiring is electrically connected to the thin film transistor;

a second metal wiring on the insulating film, wherein the second metal wiring is electrically connected to the capacitor element;

15 a pixel electrode over the insulating film, wherein the pixel electrode is electrically connected to the first metal wiring and the second metal wiring; and

a resin film between the insulating film and the pixel electrode for alleviating step differences between an edge of the first metal wiring and the insulating film and between an edge of the second metal wiring and the insulating  
20 film.

19. A light emitting device according to claim 18, wherein the resin film comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and  
25 benzocyclobutene.

20. A light emitting device according to claim 18, wherein the light emitting device is incorporated in at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a  
30 player using a recording medium, digital camera, and a projector.

21. A light emitting device comprising:  
a thin film transistor over a substrate;  
a first insulating film covering the thin film transistor;  
5 a metal wiring on the first insulating film, wherein the metal wiring is electrically connected to the thin film transistor;  
a pixel electrode over the first insulating film, wherein the pixel electrode is electrically connected to the metal wiring; and  
a second insulating film in contact with a sidewall portion of the metal  
10 wiring, wherein the second insulating film is interposed between the pixel electrode and the first insulating film, and has a curved surface at the sidewall portion of the metal wiring.

22. A light emitting device according to claim 21, wherein the second  
15 insulating film comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and benzocyclobutene.

23. A light emitting device according to claim 21, wherein a concentration  
20 of the second insulating film is 3 to 20% of that of the first insulating film.

24. A light emitting device according to claim 21, wherein the light emitting device is incorporated in at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a  
25 player using a recording medium, digital camera, and a projector.

25. A light emitting device comprising:  
a thin film transistor over a substrate;  
a capacitor element over the substrate;  
30 a first insulating film covering the thin film transistor and the capacitor

element;

a first metal wiring on the first insulating film, wherein the first metal wiring is electrically connected to the thin film transistor;

5 a second metal wiring on the first insulating film, wherein the second metal wiring is electrically connected to the capacitor element;

a pixel electrode over the first insulating film, wherein the pixel electrode is electrically connected to the first metal wiring and the second metal wiring; and

a second insulating film in contact with sidewall portions of the first metal wiring and the second metal wiring, wherein the second insulating film is  
10 interposed between the first insulating film and the pixel electrode, and has curved surfaces at the sidewall portions of the first metal wiring and the second metal wiring.

26. A light emitting device according to claim 25, wherein the second  
15 insulating film comprises one or a plurality of kinds of materials selected from the group consisting of polyimide, acrylic resin, polyamide, polyimideamide, and benzocyclobutene.

27. A light emitting device according to claim 25, wherein a concentration  
20 of the second insulating film is 3 to 20% of that of the first insulating film.

28. A light emitting device according to claim 25, wherein the light emitting device is incorporated in at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a  
25 player using a recording medium, digital camera, and a projector.

29. A method of manufacturing a semiconductor device, comprising:  
forming a thin film transistor over a substrate;  
forming a first insulating film covering the thin film transistor;  
30 forming a contact hole by etching the first insulating film;

forming a metal wiring on the first insulating film, wherein the metal wiring is electrically connected to the thin film transistor;

forming a second insulating film on the first insulating film and the metal wiring by coating;

5           etching the second insulating film on the metal wiring to expose a surface of the metal wiring; and

forming a pixel electrode on the second insulating film, wherein the pixel electrode is in contact with the metal wiring.

10           30. A method of manufacturing a semiconductor device according to claim 29, wherein the coating is performed by rotating the substrate at a rotation number of 100 to 2000 rpm.

31. A method of manufacturing a semiconductor device according to claim  
15 29, wherein the semiconductor device is at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a projector.

20           32. A method of manufacturing a semiconductor device, comprising:  
forming a thin film transistor and a capacitor element over a substrate;  
forming an insulating film covering the thin film transistor and the  
capacitor element;

forming a contact hole by etching the insulating film;  
25           forming a first metal wiring and a second metal wiring on the insulating film, wherein the first metal wiring and the second metal wiring are electrically connected to the thin film transistor and the capacitor element, respectively;

forming a second insulating film on the first insulating film, on the first metal wiring and on the second metal wiring by coating;

30           etching the second insulating film on the first metal wiring and the second



metal wiring to expose a surface of the first metal wiring and the second metal wiring; and

forming a pixel electrode on the second insulating film, wherein the pixel electrode is in contact with the first metal wiring and the second metal wiring.

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33. A method of manufacturing a semiconductor device according to claim 32, wherein the coating is performed by rotating the substrate at a rotation number of 100 to 2000 rpm.

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34. A method of manufacturing a semiconductor device according to claim 32, wherein the semiconductor device is at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a projector.

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35. A method of manufacturing a light emitting device, comprising:

forming a thin film transistor and a capacitor element over a substrate;

forming an insulating film covering the thin film transistor and the capacitor element;

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forming a contact hole by etching the insulating film;

forming a first metal wiring and a second metal wiring on the insulating film, wherein the first metal wiring and the second metal wiring are electrically connected to the thin film transistor and the capacitor element, respectively;

25 forming a second insulating film on the first insulating film, on the first metal wiring and on the second metal wiring by coating;

etching the second insulating film on the first metal wiring and the second metal wiring to expose a surface of the first metal wiring and the second metal wiring; and

30 forming a pixel electrode on the second insulating film, wherein the pixel electrode is in contact with the first metal wiring and the second metal wiring.

36. A method of manufacturing a light emitting device according to claim 35, wherein the coating is performed by rotating the substrate at a rotation number of 100 to 2000 rpm.

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37. A method of manufacturing a light emitting device according to claim 35, wherein the light emitting device is incorporated in at least one selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle-type display, a player using a recording medium, digital camera, and a  
10 projector.